PHYS 3334 – Modern Physics I
Department of Physical and Environmental Sciences and the Texas Physics Consortium
Spring 2016

A. COURSE INFORMATION

Course number/section: PHYS 3334.301
Class meeting time: MWF 12:00-12:50 pm
Class location: CCH-252
Course Website: http://www.tarleton.edu/tpc/PHYS334/Fall2015.html

B. INSTRUCTOR INFORMATION

Instructor: Dr. Anil Chourasia
Office location: Texas A&M University-Commerce
Office hours: Daily 2-4
Telephone: 903-886-5485 (Office) 903-886-5491 (Lab)
e-mail: Anil.Chourasia@tamuc.edu
Appointments: Email for appointments.

Local Facilitator: Dr. Jeff Spirko
Office location: NRC-1111 (inside NRC-1100)
Office hours: MT 10-12, R 1-2, Live Calendar: http://tinyurl.com/spirkocal
Telephone: 361-825-6020
e-mail: jeffery.spirko@tamucc.edu (preferred over phone calls)
Appointments: Email for appointments. Check Live Calendar and suggest an open time.

C. COURSE DESCRIPTION

Catalog Course Description
A course in special relativity and elementary quantum mechanics. Topics include relativistic
description of space-time, relativistic energy and momentum, the uncertainty principle,
Schrödinger’s equation, observables and operators, bound states, potential barriers, and the
quantum description of the hydrogen atom.

Extended Course Description

This course is being offered by the Texas Physics Consortium as part of the Joint BS degree
with a Physics Major. All TPC courses use the WTClass system for class management
(instead of Blackboard). For more information on TPC, please visit our website
(http://www.tarleton.edu/tpc/) or speak with the Local Facilitator.

The Course Syllabus from the sending institution is attached [Will be attached for
students] and is the primary Syllabus that the instructor will follow. This Syllabus exists
to make sure you have all of the information summarized in one place and that you are
informed about TAMUCC policies.
D. PREREQUISITES AND COREQUISITES

Prerequisites
- PHYS 2426 – University Physics II

Corequisites
- MATH 3315 – Calculus III

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)
- Modern Physics 6th Ed. by Tippler & Llewellyn.

Optional Textbook(s) or Other References
- Modern Physics Alpha to Zo by Rohlf
- Quantum, Physics of Atoms, etc. by Eisberg & Resnick
- Special Relativity (MIT Series) by AP French

Supplies
- Internet access is vital for interacting with the instructor and the local facilitator.
- Access to a scanner may be required to submit homework assignments. The Local Facilitator can help with this.

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

Specific learning objectives will be shared by the instructor in the Syllabus and during Class.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Classes will be held via live a video conference among all of the Texas Physics Consortium schools. Students will be able to ask questions during class, and the instructor will see who is asking the question.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Course requirements and grading will be discussed by the instructor during the first class.
I. COURSE CONTENT/SCHEDULE

The expected content and schedule will be distributed by the instructor during the first class.

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

The course instructor will discuss specific course policies during the first class.

K. COLLEGE AND UNIVERSITY POLICIES

- Academic Integrity (University)
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- Classroom/Professional Behavior
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- Statement of Civility
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- Deadline for Dropping a Course with a Grade of W (University)
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to
Just stopping attendance and participation **WILL NOT** automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that **must** submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar ([http://www.tamucc.edu/academics/calendar/](http://www.tamucc.edu/academics/calendar/)) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage at [http://sci.tamucc.edu/students/GradeAppeal.html](http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

  [http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be
operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. OTHER INFORMATION

- Academic Advising
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

- Local Facilitator
  The Local Facilitator is happy to help with physics questions and with administrative matters, but you, the student, are responsible for keeping track of assignments and exams. Don’t assume that the Local Facilitator knows when your exams are taking place. Keep in touch; let us know when things are happening. Proctoring takes at least a few days to arrange, so make sure things are ready and confirmed BEFORE your exam takes place.

- Primary Syllabus
  The Course Syllabus from the sending institution is attached and is the primary Syllabus that the instructor will follow.

GENERAL DISCLAIMER

We reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. We will announce such changes in a timely manner during regularly scheduled lecture periods.
Syllabus for Physics 321

ATOMIC PHYSICS

Spring 2016

Catalog Description: Atomic Physics: Three semester hours
A study of special relativity, photoelectricity, atomic structure
and spectra, X-rays, and the wave nature of matter

Supplemental Description: The course focuses on quantization of charge, light, and
energy, the photoelectric effect, Compton effect, Atomic
spectra, Rutherford scattering, elementary quantum mechanics,
and relativity

Textbook: Modern Physics
P. A. Tipler and R. A. Llewellyn
W. H. Freemand and Company, New York

Lecture Time and Place: ****************************

Instructor: Dr. A. R. Chourasia
Office: STC-232 (STC-113)
Phone: 886-5485; 886-5491; Fax: 886-5480
e-mail: Anil.Chourasia@tamuc.edu

Office Hours: 2 – 4 pm OR by appointment

Goals of the Course: Students will gain knowledge on basic experiments in physics
that led to the development of modern atomic physics. They
will learn Thomson’s experiment, quantization of electric
charge, Einstein’s photoelectric effect, scattering of radiation
by atomic particles, nuclear model, Bohr model of the atom,
and the x-ray spectra.

Grading Procedure and Scale:

The grade will be determined from homework, two exams, and the final exam as outlined
below:

- Homework and attendance (Late Homework penalty 10% each class day) 20%
- Two Exams 25% each
- Final exam (comprehensive) 30%
90 and above: A
80 and above but less than 90: B
70 and above but less than 80: C
60 and above but less than 70: D
Less than 60: F

Missing an exam without first making arrangements for make-up with the instructor (excused absence cleared before the exam) will automatically consume the failing grade. Missing other class periods will result in penalties as described under the attendance section below.

Any decision to curve the grade will be taken at the end of the semester. **Five unexcused absences will automatically result in a failing grade.**

**Lecture (Tentative)**

Chapter 1  Relativity I
Chapter 3  Quantization of Charge, Light, and Energy
Chapter 4  The Nuclear Atom
Chapter 5  The Wavelike Properties of Particles
Chapter 6  The Schrodinger Equation
Chapter 7  Atomic Physics
Chapter 8  Statistical Physics

**Final Exam is on __________________**

**Attendance and Tardiness:** Students are expected to be on time and present for all class meetings. Excused absences can be arranged prior to the class period being missed for appropriate activities as determined by the instructor. If an emergency results in an absence, the student should contact the instructor as soon as possible informing the instructor of the emergency and inquiring about ways to make up the missed class. The instructor will make judgements on how to handle the situation. Possible reasons for an excused absence are listed in the “Student’s Guidebook” under class attendance policy.

**Classroom Behavior:** Disorderly conduct which interferes with the normal classroom atmosphere will not be tolerated. The classroom instructor is the judge of such behavior and may instruct a disorderly student to leave the room with an unexcused absence or in more serious situations a student may be removed from the class with a failing grade.

**Cheating and other Breaches of Academic Conduct:** Academic cheating, plagiarism, and other forms of academic misconduct may result in removal of the student from class with a failing grade or may in extreme cases result
in suspension or expulsion from the University as described in the “Code of Student Conduct” section of the “Student’s Guidebook”.

**Students with Disabilities:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

**Office of Student Disability Resources and Services**  
**Texas A&M University-Commerce**  
**Halladay Student Services Building**  
**Room 303 A/D**  
**Phone (903) 886-5150 or (903) 886-5835**  
**Fax (903) 468-8148**  
**StudentDisabilityServices@tamu-commerce.edu**

**Evaluation of Instruction:** Students will be given opportunities to evaluate instruction near the end of the semester. The physics department utilizes a scantron graded questionnaire with statements regarding various elements of instruction and in addition utilizes an open ended form where students can make comments on all elements of the classroom. These comments are given to the instructor and department head soon after the grades are recorded. If students have concerns about the classroom experience during the semester they should inform the instructor of those concerns and failing a satisfactory response may, as a last resort, contact the physics department head with those concerns.

A&M-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.